

SENSATION AND PERCEPTION.—I.

VERY different meanings have been attached to the words sensation and perception by different writers; and this diversity of meaning is to be met with in physiological as well as in more strictly philosophical works. Yet it is most important that we should come to a definite understanding upon the subject, in order to know whether certain physiologists have been warranted in assigning sensation and perception to different parts of the brain, as functions of separate portions of this principal organ of mind.

The distinct issue raised is, Are physiologists justified in assuming that the so-called sensory ganglia, at the base of the brain, are the centres in which mere unconscious nerve impressions are converted into conscious sensations? are these ganglia, in fact, in any sense, seats of Consciousness?

Almost everyone understands that both sensation and perception, however they may be supposed to differ from one another, are nevertheless conscious states, or modes of consciousness in the special and ordinary acceptation of the term. But there is one distinguished writer, at least, who has most strenuously objected to this limitation, in the case of the word sensation. Mr. G. H. Lewes maintains* that what most other people term mere impressions or unconscious nerve actions, should really be regarded as sensations, and should be entitled also to the attribute of consciousness—not in its more special acceptation, but in accordance with the very general meaning which he attaches to this word. For the sensations and perceptions of other writers—those impressions to which our attention is given—he reserves the single term perception, apparently because he considers there is no fundamental distinction between them. With this latter part of his doctrine, as will be seen, we are disposed thoroughly to agree, though we cannot assent to the propriety of so far revolutionising the meanings of the words sensation and consciousness. The fundamental position which Mr. Lewes assumes, and upon the strength of which he considers it desirable to make such an innovation in the meanings of thoroughly accepted terms is:—"that sensibility is the *property inherent in ganglionic tissue*—the one peculiar 'force' belonging to all nerve centres, as neurility belongs to all nerves."† Now Mr. Lewes himself points out, that the only means of upsetting his argument (which must be otherwise logically irrefutable) is to deny that sensibility is a *property* of ganglionic tissue, and to look upon it as a *function* rather of certain nerve centres. And this really seems to us to be the conclusion most strongly supported by obtainable evidence. Instead of believing sensibility to be the property inherent in ganglionic tissue, should we not rather assign to this some more general characteristic, such as molecular instability, conferring upon it a property of mere *impressibility*—of which sensibility and consciousness are the most specialized modes, dependent upon the organisation and molecular instability of certain nerve centres of the cerebral hemispheres? Mr. Herbert Spencer‡ calls a ganglion cell a *libero-motor* element; because in the most general conception of its property it seems to be a portion of extremely unstable matter, in which the molecular movements imparted to it by the afferent nerve-fibre undergo a prodigious multiplication before producing their ulterior effects.

Just as we meet with this notable exception to the generally received meaning of the word sensation, so also has the word perception been endowed with an altogether special meaning, by that school of philosophers known as Natural Realists: some of them have removed it also from the sphere of consciousness as ordinarily understood. Space will not permit of my showing how they differ amongst themselves in minor shades of meaning:

I will only now quote the views of Dugald Stewart. He says:—"In order to form an accurate notion of the means by which we acquire our knowledge of things external, it is necessary to attend to the distinct meanings of the words *sensation* and *perception*. The former expresses merely that *change in the state of the mind* which is produced by an impression upon an organ of sense (of which change we can conceive the mind to be conscious without any knowledge of external objects); the latter expresses the *knowledge* we obtain by means of our sensations of the qualities of matter." This is an explanation of perception which to most physiologists would appear absolutely meaningless. It seems itself utterly incomprehensible. Stewart conceived perception to be a distinct mental act by which we obtain a "knowledge" of the properties of matter as existing, and in themselves. But, strange to say, this "knowledge" we "obtain by means of our sensations;" even though by the word *sensation* Stewart understood "merely that change in the state of the mind which is produced by an impression upon an organ of sense." How, through such changes in the state of the mind, we are to arrive at an immediate knowledge of the *things* without which, *ex hypothesi*, the changes are not produced, we are at a loss to understand; and neither do we see how it can be reconciled with Stewart's own theories, seeing that, according to him, consciousness "denotes the immediate knowledge which the mind has of its sensations and thoughts, and, in general, of all its present operations." On the one hand, "knowledge" is made to transcend the sphere of consciousness; whilst on the other, it is said that "of all the present operations of the mind, consciousness is an inseparable concomitant."

With these exceptions, the different acceptations of the words sensation and perception are less divergent, inasmuch as nearly all other writers suppose consciousness, in the ordinary meaning of the word, to be an attribute of both states. And if they are both modes of consciousness, then the only further question to be considered is, whether there is any fundamental difference between them, such as would warrant physiologists in assuming the existence of an organic centre for the realisation of sensations, altogether distinct and apart from that whose functional activity gives rise to perceptions; or whether the two words are applicable only to the extremes of a series between whose terms there are the most innumerable and insensible gradations? If the latter view be the correct one, if the difference is one of degree rather than of kind, then we should be much more consistent in regarding sensations and perceptions as arising from the activity of one and the same organ; and from a consideration of this question we may, therefore, derive some help towards the correct interpretation of the results of operations on the brains of certain lower animals, which have hitherto given rise to much discussion amongst physiologists.

Professor Bain has well shown, in his "Emotions and Will," how sensation in its most strict acceptation does insensibly merge into that which is more usually spoken of as perception. He shows that the more "sensation involves cognitive or intellectual processes, the more liable is it to fall under the title of perception." "Some sensations," he says, "are mere pleasures and pains, and little else; such are the feelings of organic life, and the sweet and bitter tastes and odours. Others stretch away into the region of pure intellect, and are nothing as respects enjoyment or suffering; as, for example, a great number of those of the three higher senses." But it seems to us that Mr. Bain stops short of the truth when he says,† "the lowest or most restricted form of sensation does not contain an element of knowledge." It does not contain knowledge, it is true, in its highest sense, involving affirmation and belief, but as a state of consciousness it is

* "Physiology of Common Life," vol. ii. 1859.

† Loc. cit. p. 20.

‡ System of Philosophy, No. 20, 1868.

* Collected works of Dugald Stewart, edited by Hamilton, vol. ii. p. 14.

† Loc. cit. p. 586 (Second Edition).

inseparable from knowledge in its essence, which implies *discrimination of difference or agreement*. We, in common with others, would rather believe that no sensation, not even the simplest, can exist without the elements of cognition being at the same time present in consciousness.

The word perception has, undoubtedly, been used for the most part to signify something which may be termed an intellectualised sensation, and in the purest form of it the amount of mere feeling is reduced to a minimum, whilst the amount of intellectual action involved has undergone a corresponding increase. A perception is a fully elaborated sensation, from which we derive our notion of the nature of an external object—such object being recognised immediately and intuitively, not so much by the mere light of the single present impression, as by the blending of this with revived memories of all other impressions which have, at various times, been related to the one now present. Thus we get a comprehensive notion of the nature of the external object, though a notion which must, to a certain extent, vary with the individual according to the nature of his previous experience. A savage who had never seen gunpowder before, would have a very different notion called up by the sight of it, from that with which a European would be inspired who well knew its composition and properties. To the one it would be a simple black powder, and by him it would be perceived more or less simply as belonging to this category; whilst the other's notion of the same substance would be more complex, containing ideas as to the ingredients of which it is composed, and as to the effects which it is capable of producing by explosion in various ways. But between such states of knowledge, and others which might be regarded as the simplest specimens of mere feelings or sensations, there is not a difference in kind, only one of degree. Any sensation, however simple, can only be recognised as such—can only be revealed in consciousness—inasmuch as it presents a certain quality or qualities, by which it can be differentiated from or classed with previous states of feeling. Therefore even the most simple sensation does necessitate the existence of intellectual activity, since discrimination is the most fundamental mode of intellect. And, in those more complex sensations, generally named perceptions, the only difference, as previously indicated, is that the feeling, as mere feeling, is reduced to its lowest ebb, whilst the amount of intellectual activity, combined in the form of discrimination and memory, has proportionately increased. For by virtue of that association always occurring during the education of the individual between various related sensations, organic and organised relations have been established in the brain, so that a present sense impression rouses simultaneously memories of other past impressions derived from any given object, either by the same or through different avenues of sense; and this blending either actually or potentially of all our past knowledge concerning the same or similar objects with the new impression, goes to constitute our then present perception. "Thus," as we have said elsewhere,* "I see an orange at a distance: this, as an object of visual sense, is simply a rounded yellow area; but past experience has led me to know what are the tactual and muscular sensations usually associated with the sight impressions—how it is really a spherical body with a somewhat rough surface. Then I have learned also that these impressions are usually associated with a certain odour, with a certain taste, a degree of succulence, and certain internal optical characters, including a divisibility into segments, and the possible presence of seeds within. A combination of any of these, or of a host of other revivable impressions, may go to constitute my perception of an orange, and may flash into consciousness more or less simultaneously on

the presentation of the object to the visual sense." But as we have previously said, between this comparatively complex resultant, and what would be called a simple sensation, some mere odour or taste, there are other sensations of all intermediate degrees of complexity; and even such simple forms of sensation could not be realised in consciousness without our *knowing* them as sensations possessing such and such characters: to be *known* at all, they must be known qualitatively, and to recognise their qualities is to know them in relation to certain other past impressions which we may have experienced; and thus, in fact, we may look upon it as almost certain, that even the simplest conscious impression can only be known or realised in consciousness so long as intellectual action of some kind is brought to bear upon its recognition.

Hence it may be legitimately maintained, that there is the strongest *à priori* objection to the view which has been so generally held amongst physiologists, that there is an inherent difference between a sensation and a perception, and that there are distinct nerve-centres, by the activity of which such states or acts respectively are called into being. And whilst psychological evidence is thus strongly in favour of the supposition that all sensations, whether simple or complex, do reveal themselves in one organ only, we think we shall also be able to show that physiological evidence is, moreover, quite in harmony with the opinion that the cerebral hemispheres themselves are the sole seats of consciousness, whether for simple sensations or for complex sensations; and that there is no lower organ for "mere sensations" only, as they have been termed—no *sensorium commune* as ordinarily understood, in which impressions reveal themselves in consciousness before impinging upon the cortical grey substance of the cerebral hemispheres.

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MISTLETOE

WHEN the leaves are rotting on the ground, and the fruit has been converted into cider, the orchards of Herefordshire and Worcestershire still retain something of their verdant hue, and are green with what seems at first to be untimely foliage. But mistletoe cannot be unseasonable at Christmas, and there are those who would be glad to have it in season "all the year round." The supply from the West Midland Counties is practically inexhaustible, for it has been calculated that from 30 to 90 per cent. of the apple-trees are infested by this parasite, two or three boughs of which may sometimes be seen dependent from some old carked limb. Its presence is at once the cause and the sign of incipient decay. A struggle for life between the tree and its enemy has begun, and, if the pruning-knife or the demands of Christmas do not interfere, the mistletoe will slowly and surely exhaust the branch upon which it grows, penetrating further and further into the wood as the supply of sap recedes, and ever sending forth fresh roots in place of those which were overpowered at first. The severity of the struggle between these seemingly unequal foes may be sometimes seen in the strange fantastic contortions into which the branches twist themselves, and sometimes in the withered aspect which the whole tree wears when, as Shakespeare says, it stands

Forlorn and lean,
O'ercome with moss and baleful mistletoe.

The entire existence of this parasite is full of interest, even though the mystery of its birth has been removed. Modern research confirms the accuracy of the old distich which expresses thus its origin:—

The thrush, when he pollutes the bough,
Sows for himself the seeds of woe;

and perhaps the increase of mistletoe may be partly attributable to the disuse of its product (bird-lime), and the greater immunity which thrushes in consequence enjoy. But those who desire to do so may easily propa-

* "On the Muscular Sense, and on the Physiology of Thinking." (Brit. Med. Journal, May 1869.)